

A GYNANDROMORPHOUS MUTILLID.<sup>1</sup>

BY WILLIAM MORTON WHEELER.

On the first day of August, 1910, while I was collecting in a dry upland pasture near Colebrook, Litchfield County, Connecticut, my attention was attracted by a small Mutillid with wings only on one side. It was running over the ground very rapidly, and on being captured proved to be a very handsome lateral gynandromorph of *Pseudomethoca canadensis* Blake, the right half of the body, including the appendages, being purely male and black, whereas the left half was largely of a rich red color and, except in a few insignificant details, purely female. Although the legs on the left side are stouter than those on the right the insect did not move in a circular but in a rectilinear path and was therefore able to compensate the difference in the strength of the appendages on the two sides of the body. The specimen was not dissected, since, owing to the small size of the abdomen and the hardness of the integument, I was sure of injuring the specimen and by no means sure of gaining an adequate conception of the structure of the reproductive organs. There can be little doubt, however, that these organs consist of an ovary on the left and a testis on the right side. The accompanying camera drawing of the insect in dorsal view, and of the head as seen from the front, together with the following description, will give an idea of the external structure:

The specimen is a little over 5 mm. in length. The two halves of the body, owing to the pronounced sexual dimorphism, are asymmetrical. The head is much smaller on the right than on the left side. The eyes are of nearly equal size; two ocelli are present on the male side, namely the anterior, or median, and the right lateral ocellus. The right mandible is tridentate, the left simply falcate. The right antenna is 13-jointed and much longer than the left, which is 12-jointed. The sharp line which separates the black coloration of the right from the red of the left side of the head begins at the middle of the occipital border, runs forward just a little to the left of the median ocellus, and terminates a little to the right of the middle of the clypeus. The clypeus

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is black on both sides; the right mandible is black, the left red. The scape of the left antenna and the two basal joints of the funiculus are red. The tip of the second funicular joint, together with the third and fifth joints, are dark brown and the remainder of the funiculus is black. The palpi on the right side are black, on the left side red, with their terminal joints infuscated. The left side of the head bears on the lower side the peculiar tooth and carina so characteristic of the female, whereas these structures are lacking on the right side. The left half of the thorax is typi-

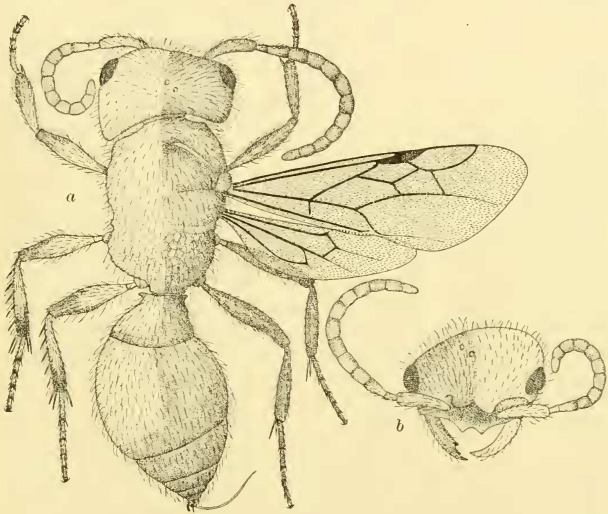


Fig. 1. *Pseudomethoca canadensis* Blake, lateral gynandromorph; a, dorsal aspect; b, head seen from the front.

cally female, without sutures and deep red; the right half is somewhat longer and of the male type and black, with the sharp line separating the two halves rather sinuous or indentated towards the right in two places which correspond with the transverse suture between the mesonotum and scutellum and with that between the scutellum and metanotum. The epinotum is dis-

tinctly more convex and rounded on the right than on the left side. The tegula is well developed and the wings are normal on the right but completely lacking on the opposite side. The right legs are entirely black, except the spurs, which are white, and lack the spines on the extensor surfaces of the tibiæ. On the left side the legs have distinctly incrassated femora and somewhat clavate tibiæ. They are red, except the distal halves of the femora and tibiæ and the tips of the tarsal joints, which are black. The middle and hind tibiæ have the prominent spines so characteristic of the female on their extensor surfaces. The abdomen has six complete segments and apparently a vestige of a seventh on the right. It is asymmetrical owing to the enlargement of the second segment on the left, or female side. It is black, except for a large red spot on the left side of the middle line on the first and another similar but larger spot on the second segment. The line separating the male from the female half of the abdomen on the dorsal side runs a little to the right of the middle line but on the ventral surface it is very nearly median. The appendages at the tip of the abdomen are represented by the left half of the sting sheath, the left stylet and the left half of the gorgonet which is very long and slender, fully exerted and curved over to the right. The hypopygial area of the female is also recognizable on the left side. The male appendages are much less distinct, but it seems to be possible to detect what corresponds to the right stipes. The sculpturing on the two sides of the body corresponds to that of the respective sexes, the punctation being nearly the same on both sides of the head but decidedly coarser on the pro- and mesonotum of the right than on the corresponding regions of the left side of the thorax. The left pleuræ are concave and glabrous, on the right side they are convex and coarsely punctate. The reticulate rugosity of the right half of the epinotum is coarser than that on the left half. The hairs on the right half of the head and thorax are distinctly longer than on the left half of these regions. Those on the entire male half are glistening white. They are also glistening white on the female half except on the second abdominal segment where those at the base and apex are black and those in the middle are yellow. The hairs on the legs are not appreciably longer or more abundant on the right than on the left side.

This description shows that the only particulars in which the left or female side departs from that of the normal female is in the coloration of the clypeus and the base of the third abdominal segment. Both of these regions are red in the normal female. At any rate, I find them to be of this color in some thirty specimens which I have examined, in twenty-eight collected by Mr. C. T. Brues at Woods Hole, Mass., several years ago, and in two taken by myself at Forest Hills, Mass., and Colebrook, Conn., during the past summer. In the mounted gynandromorphous specimen the third abdominal segment may be red at the extreme base, but it is drawn into the second segment so far that I am unable to determine its complete coloration.

Reference to the work of Dalla Torre and Friese on gynandromorphous Hymenoptera<sup>1</sup> shows that up to 1898 only one gynandromorphous Mutillid had been seen, and I have been unable to find that any others have been described within more recent years. The specimen mentioned by these authors is a *Mutilla europæa* L. var. *obscura* Nyl. which was described and figured by Maeklin in 1856.<sup>2</sup> This specimen, which was taken at Helsingfors, Finland, was a very perfect lateral gynandromorph, in which, however, the sex of the two sides was the reverse of that in the above described specimen of *Pseudomethoca*, being female on the right and male on the left side. Owing to the fact that the female *Mutilla obscura* has a dark head and the male a very similar coloration of the abdomen to that of the female the contrast between the two sides in Maeklin's specimen is less striking than in the one described above, and, as shown in his colored plate, shows strongly only in the thoracic region. There is, however, a distinct asymmetry of the abdomen, owing to the more bulging outline of the second abdominal segment on the female side. The specimen also shows the wings beautifully developed on the male side, and the strong contrast between the two antennæ.

*Pseudomethoca canadensis* is apparently a parasite on certain

<sup>1</sup> Die hermaphroditen und gynandromorphen Hymenopteren. Ber. naturwiss. med. Ver. Innsbruck, XXIV, 1898 (1899), pp. 1-96, 1 pl.

<sup>2</sup> Om hermafroditism bland insekterna, samt beskrifning öfver en i Helsingfors funnen hermafrodit af *Mutilla obscura* Nyl. Öfvers. af Finska Vetensk. Soc. Forhandl. III 1856, pp. 106-112, 1 pl.

of our burrowing bees of the genus *Halictus*. Some years ago Melander and Brues published an interesting account of *H. pruinosus* Robertson.<sup>1</sup> In this they showed that the most formidable enemy of the bee is the *Pseudomethoca*. They found that the female *Pseudomethoca* hangs about the burrows and attacks the female bee, and they have given a very entertaining figure and description of a battle between the bee and the Mutillid. Fully fifty specimens of the latter insect were taken from one square meter of *Halictus* colony during a single summer. In the dry pasture in which I found the gynandromorph there were many *Halictus* colonies, so that, in all probability, the specimen had passed through its larval and pupal development in one of the nests.

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## LIST OF SPHINGIDÆ OF AMERICA NORTH OF MEXICO.

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Since Rothschild & Jordan issued their Revision of the Lepidopterous Family Sphingidæ in 1903, no attempt has been made to give a complete list of our North American species based upon this monograph. Holland in his Moth Book follows their work but his list does not pretend to be complete; as several new additions to our fauna have lately come under our notice, and as we have been made aware of several slight errors in the revision relating to North American species, it has occurred to us that an annotated list would perhaps be of service to collectors and future catalog makers. We have followed the revision as regards nomenclature in nearly every case, basing our remarks upon material in Coll. Barnes, which is practically complete in North American Sphingidæ. The list of localities is not intended to be exhaustive, but in most instances merely mentions localities from which we actually possess specimens.

For the benefit of those unfamiliar with Rothschild & Jordan's

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<sup>1</sup> Guests and Parasites of the Burrowing Bee *Halictus*. Biol. Bull. V, No. 1, June 1903, pp. 1-27, 6 figs.